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THE DEMAND FOR LABOR IN ALASKA

INTRODUCTION

No one demands labor for its own intrinsic value. Rather, the demand for labor is derived from its ability to produce goods or services that ultimately satisfy the purchasing power and desires of consumers. Sometimes this link is quite direct; retail trade establishments hire workers based on their level of consumer sales. Other times, the link can be indirect and not at all obvious. For example, the demand for labor in Alaska's resource sectors (such as forestry, fisheries, or energy) is determined by consumers throughout the United States, and indeed, the world. In all cases, however, the reason for labor being demanded is its ability to produce products which ultimately satisfy the desires and purchasing power of consumers. It is in this sense that economists refer to the demand for labor as a "derived demand."

The demand for labor in some Alaska industries is derived primarily from national or international consumer markets. These are called the state's "basic" industries. Other industries derive their demand for labor primarily from consumer markets within the state, and they are called the state's "nonbasic" industries. When Japanese housewives a few years ago organized a consumer boycott to protest the high price of herring roe, the demand for labor in one of Alaska's basic industries (fish products) declined. The demand for labor in the state's nonbasic industries on the other hand derives from the purchasing power and desires of Alaska residents. [1]

[1]For a more complete discussion of the basic/nonbasic concept, see: Theodore Lane, Eric Swanson, and Marc Reeder, *A Forecast of Industrial and Occupational Employment in Alaska* (ISER, 1974), pp. 169-172.

Employers, however, do not really demand labor in general. They demand workers with specific skills, experience levels, or other types of occupational qualifications. Employers who need carpenters will not hire persons who have worked only as retail clerks, and recent high school graduates are not substitutes for workers with long years of experience in any field. Instead of a general demand for labor, what really exists are many different demands for many different types of labor. This is the concept of "occupational labor demand," and it is critically important in understanding how Alaska's labor markets operate. It can result in a situation where employers are demanding types of labor which they cannot find while, at the same time, unemployed persons are looking for work and yet cannot get hired. When such a mismatch occurs between the skills that employers want to hire and those that state residents possess, we have a situation known as "structural unemployment." This situation occurs when the structure of labor demand does not fit the structure of occupational skills embodied in (or supplied by) the state's working age population.

While the patterns of industrial and occupational demand are central to understanding how the demand for labor has changed in Alaska, we need to mention several other qualifications. One of these is that the market demand for labor will be affected by the size of the firm doing the hiring. Larger firms will often satisfy their requirements for skilled labor by internal promotion. Only their lower-skilled, entry-level posi-

This *Review* examines the nature of Alaska's changing labor demand both by major industrial sector and by occupational sector. It also discusses changes in Alaska's labor demand that may be expected to occur over the next decade.

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FEATURE

Theodore Lane — The Demand for Labor in Alaska

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tion may be filled by outside hiring. A firm which is expanding its operations in Alaska, for example, may require an additional supervisor of computer systems. It may satisfy its requirements by promoting a systems analyst whose job will be filled by the promotion of a senior programmer; the senior programmer's vacancy will be filled by the promotion of a junior programmer. The firm will then go into the general labor market and hire a junior programmer. This process of promotion from within means that a firm's labor requirements may be quite different than its demands for labor in the general market. Thus, the distinction between labor requirements and labor demand could become significant, particularly as large firms become a more important component of Alaska's economy.

A second qualification is that a firm's demand for labor will result in different hiring practices, depending upon the immediacy of its production requirements. For example, in the processing of fish products, employers have little ability to schedule production. When the fish arrive at the dock, they have to be unloaded and processed immediately to prevent spoilage. Furthermore, the entire fish processing industry can only operate when the fish are running and it is legal to harvest them. When this type of situation exists, the timing of the demand for labor will be determined by the availability of the resource, although the magnitude of demand will still be derived from the purchasing power and desires of the ultimate consumers.

The demand for labor in such resource-based industries will be highly seasonal regardless of its magnitude (i.e., the number of persons hired) in any particular year. However, in these types of seasonal industries, part of the magnitude of demand will result in adjustments in average hours worked per employee rather than the number of employees hired. Using the fish processing industry again as an example, if the run is larger than anticipated, fish processing plants will not have the time to recruit additional workers. The response will then be to employ the existing work force for longer hours each day. In a similar manner, very short-term increases in labor demand will often be satisfied by employers offering their workers overtime hours. Where a job requires on-site training and the increased labor demand is expected to be of short duration, employers will find it cheaper to pay overtime wages than to train additional workers.

Finally, the demand for labor is affected in the long run by the interaction of wages, productivity,

and technology. The profitability of any business enterprise depends on its ability to control costs—to use labor, equipment, energy, and materials in the most-efficient, least-cost combination possible. Over long periods, this results in a condition where profitable businesses use labor, capital, and other productive factors in such a manner that the real cost of each factor is in proportion to its productivity. As the real cost of labor changes relative to other factors of production, businesses will consequently strive to vary the amount of labor used in order to re-establish the relative balance between cost and productivity. (for example, if labor costs increase, businesses will try to reduce the amount of labor used.) The process by which this is done is known as "technological change," wherein less expensive factors are substituted for more expensive ones in the production process. Since a business cannot change its entire plant and equipment easily or quickly, the interaction of relative labor costs and technological change on the demand for labor is usually felt only in the long run.

Both long- and short-run influences have operated on the demand for labor in Alaska over the past two decades. The balance of this *Review* will examine the nature of Alaska's changing labor demand first by major industrial sector and then by occupational sector. The report concludes with a discussion of changes that may be expected to occur during the next decade in Alaska.

INDUSTRIAL LABOR DEMAND

Throughout the 1960s and early 1970s, the demand for labor in Alaska from all sources (including active military) increased at a moderate rate. Construction of the Trans-Alaska Pipeline System (TAPS) led to a rapid expansion in the state's labor demand during 1974 through 1976. However, after pipeline construction was completed in 1977, the growth of demand returned to its long-term trend (Figure 1). This trend, however, appears to have shifted upward, and the average annual increase in labor demand is now about 1,700 jobs a year greater than it was during the pre-pipeline period.

An economic data base for Alaska developed by ISER as part of its Man-in-the-Arctic program (MAP) allows for the organization of employment demand data into the categories suited for economic analysis. Using these data, Table 1 presents employment in Alaska between 1961 and 1980.

Throughout this period, active military employment declined and its relative importance for Alaska's economy fell significantly. During the early years of

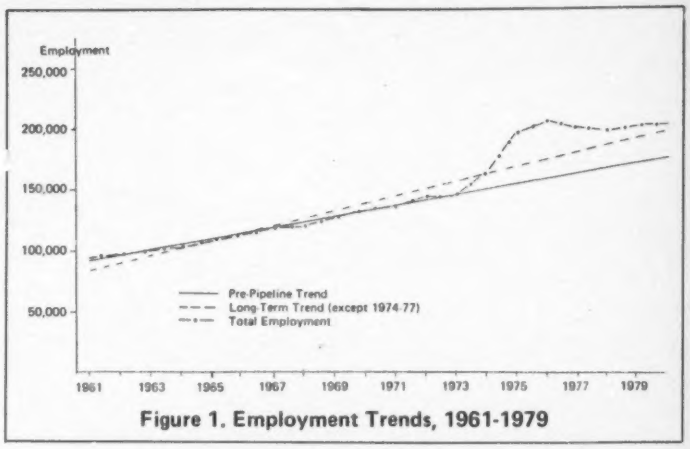

Figure 1. Employment Trends, 1961-1979

the 1960s, active military employment fluctuated between 32,000 and 33,000 persons, about half of total civilian employment in the state. By the end of the 1970s, active military personnel had declined to about 22,500 persons, less than 15 percent of the state's total civilian jobs. While there were fewer than two civilian workers for every military person in Alaska by 1961, by 1980 there were almost nine civilian workers for every active duty military person. The 20-year span from 1961 to 1980 consequently saw Alaska's economy shift from domination by the military sector to a situation where military activity, while still important, was no longer the dominant influence in the state.

Table 1 and Figure 2 show the changing relationship between basic and total wage and salary employment in Alaska from 1961 through 1980. In the early 1960s there were approximately three quarters of a nonbasic job for every basic job in the economy.[2] By the end of the 1970s, this relationship had become almost one nonbasic job for every basic job. In terms of the technical structure of Alaska's labor markets, this implies a shift in the state's job creation multiplier.[3]

Between 1961 and 1973 basic and nonbasic employment increased in a roughly proportionate manner. Between 1973 and 1976, both types of employment grew rapidly as a result of the TAPS construction. With the end of TAPS construction,

[2]We classify local and state governments in Alaska as "basic" activities since they derive most of their revenues from oil taxes and royalties which are unrelated to the level of earned income in the state. In other states, where state and local government services are mostly financed by revenues on locally earned income, they would be considered as "nonbasic" activities.

[3]The job creation multiplier is the ratio of total employment to basic employment.

Table 1

Alaska Employment, 1961-1980
(in thousands)

Year	Total Employment	Active Military	Total Civilian Employment	Wage and Salary Employment			
				Self Employment	Total	Basic	Nonbasic
1961	94.3	32.5	61.8	4.9	56.9	32.9	24.0
1962	97.1	33.0	64.1	5.4	58.7	34.5	24.2
1963	100.7	33.0	67.7	5.6	62.1	37.0	25.1
1964	103.8	32.4	71.4	6.0	65.4	39.0	26.4
1965	110.0	33.0	77.0	6.5	70.5	41.3	29.2
1966	113.5	33.2	80.3	7.1	73.2	43.8	29.4
1967	118.4	33.7	84.7	7.9	76.8	45.3	31.5
1968	120.2	32.6	87.6	7.8	79.8	46.8	33.0
1969	127.0	32.3	94.7	8.1	86.6	49.6	37.0
1970	132.9	31.4	101.5	9.0	92.5	52.1	40.4
1971	136.5	29.9	106.6	9.0	97.6	54.1	43.5
1972	144.1	30.8	113.3	9.1	104.2	57.4	46.8
1973	146.3	27.0	119.3	9.5	109.8	61.1	48.7
1974	163.7	25.5	138.2	10.0	128.2	68.3	59.9
1975	197.7	25.3	172.4	11.1	161.3	82.9	78.4
1976	207.5	24.4	183.1	11.9	171.2	89.8	81.4
1977	202.1	25.0	177.1	13.0	164.1	82.9	81.2
1978	199.8	22.5	177.3	14.0	163.3	81.3	82.0
1979	204.4	23.3	181.1	14.7	166.4	85.0	81.4
1980	206.1	21.3[a]	184.8	15.2[a]	169.6[b]	N/A	N/A

[a]Estimated by 5-year linear extrapolation.

[b]Alaska Department of Labor, Research and Analysis, estimate.

Source: MAP Data Base, 1981 Revision.

total basic employment dropped sharply while nonbasic employment continued at a new, high plateau, and in one year (1978) was actually the larger of the two.

To fully understand these aggregate trends, it is necessary to look at the various major components of both the basic and nonbasic sectors.

Labor Demand by Basic Industries

Natural Resource Sector

Oil and Mineral Industries. Table 2 and Figure 3 show the extreme variation among the different industries that constitute Alaska's natural resource sector. The greatest volatility in this sector occurred in the oil and minerals group. Mining employment (including the exploration for oil) fluctuated at a low level of activity (1,000 to 1,500 workers) during the early 1960s. Intensive exploration on the North Slope caused a flurry of activity during the late 1960s; yet by 1973, total oil and minerals employment was only 800 workers greater than it had been 12 years earlier. Construction of TAPS changed all of that. Between 1973 and 1976, employment in the oil industry (including construction of TAPS) increased by over 18,000 workers, and the actual impacts of TAPS construction were even greater when non-oil-industry activity is included. In a detailed study of the influence of pipeline construction on the Alaska economy, Scott Goldsmith and Lee Huskey estimated that approximately 22,000 workers were employed by the Alyeska Pipeline Company: about 75 percent in construction; 15 percent in business services; and 8 percent in transportation, warehousing, communications, and trade (2 percent of the workers were

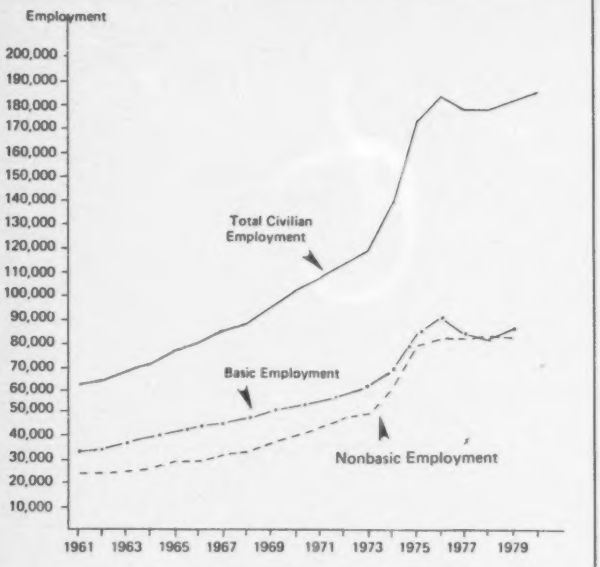

Figure 2. Basic and Nonbasic Employment

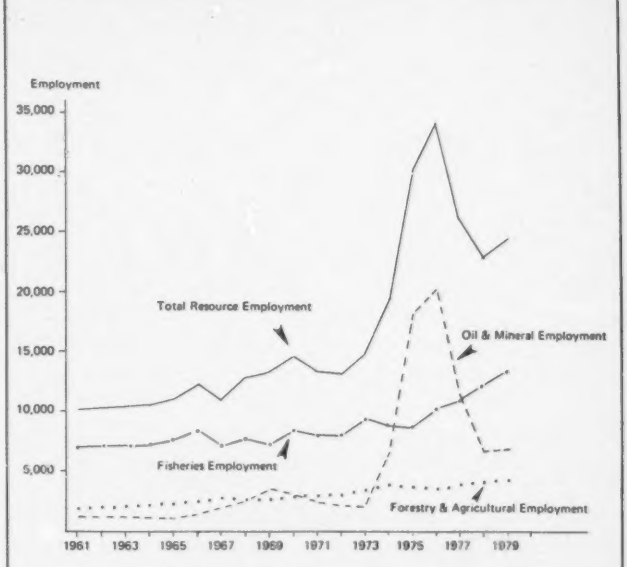

Figure 3. Resource Sector Employment

Table 2

Alaska Resource Sector Employment, 1961-1979
(in thousands)

Year	Total Resource Employment	Oil and Minerals				Fisheries			Forestry and Agriculture		
		Total	Mining	Pipeline Construction	Pipeline Transportation Operations	Total	Fishing[a]	Food[b] Processing	Total	Agriculture & Forestry Workers	Lumber, Wood, & Paper Workers
1961	10.2	1.2	1.2			7.0	4.2	2.8	1.9	0.2	1.7
1962	10.3	1.2	1.2			7.1	4.3	2.8	2.0	0.1	1.9
1963	10.4	1.2	1.2			7.1	4.1	2.9	2.1	0.1	2.0
1964	10.5	1.1	1.1			7.2	4.6	2.6	2.2	0.1	2.1
1965	11.0	1.1	1.1			7.6	4.6	3.0	2.3	0.1	2.3
1966	12.2	1.4	1.4			8.4	5.0	3.4	2.4	0.1	2.3
1967	10.9	2.0	2.0			7.1	4.0	3.1	2.7	0.1	2.6
1968	12.8	2.5	2.5			7.7	4.4	3.3	2.6	c	2.5
1969	13.3	3.5	3.5			7.2	4.0	3.2	2.6	0.1	2.5
1970	14.6	3.0	3.0			8.4	4.7	3.7	2.9	0.1	2.8
1971	13.3	2.4	2.4			8.0	4.4	3.6	2.9	0.1	2.8
1972	13.1	2.1	2.1			8.0	4.3	3.7	3.0	0.2	2.8
1973	14.8	2.0	2.0			9.4	4.8	4.6	3.4	0.2	3.2
1974	19.1	6.4	3.0	3.4		8.8	4.5	4.3	3.8	0.2	3.6
1975	30.6	18.2	3.8	14.4		8.7	4.4	4.3	3.6	0.2	3.4
1976	34.1	20.3	4.0	16.3		10.3	5.1	5.1	3.5	0.3	3.2
1977	26.1	11.4	5.0	5.8	0.6	10.9	5.4	5.5	3.8	0.4	3.4
1978	23.0	6.7	5.6		1.1	12.3	6.0	6.3	4.1	0.5	3.6
1979	24.5	6.9	5.8		1.1	13.5	6.4	7.1	4.2	0.5	3.7

[a]Estimates of fishing employment constructed by George Rogers.

[b]Almost all (about 95 percent) of Alaska's food-processing employment takes place in its fisheries.

[c]Less than 50 employees.

Source: MAP Data Base.

miscellaneous or otherwise unaccounted for).[4]

Continued oil exploration coupled with increased mining activity related to the rising price of precious metals gave this sector an average annual employment of between 6,500 and 7,000 workers during the last few years of the 1970s, even after pipeline construction was completed.

Fishing and Fish Processing. The second major component of the resource sector relates to fishing and fish processing. In terms of total workers employed, this component was highly stable throughout the 1960s and early 1970s, employing between 7,000 and 8,500 workers. During the late 1970s, a series of record salmon runs produced rapid growth in fisheries employment (particularly in the industry's fresh and fresh-frozen fish parts), with total jobs increasing to approximately 13,500 in 1979.

Fisheries employment, however, has been more stable on a year-to-year basis than is indicated by the data in Table 2 or Figure 3. This industry regularly adjusts its labor demand by average hours worked as well as the number of persons hired. Table 3 shows food-processing employment during the years 1970 through 1975. It also shows the average weekly hours worked within Alaska's manufacturing sector and the adjusted (i.e. full-time equivalent) employment. Over the 6 years shown in Table 3, the average annual variation in employment was about 10.4 percent when calculated on the basis of persons employed, but was only about 7.9 percent when calculated from the adjusted, full-time equivalent work force.[5]

The fisheries component of the total resource sector consequently displays two striking characteristics. First, adjustments in average hours worked cause the work force to exhibit more year-to-year stability than is apparent from the unadjusted employment data. Second, within any single year, there is extreme seasonal variation in employment. For example, in 1974 employment showed a seasonal variation of approximately 35 percent, as compared with the state average for the same year of approximately 12 percent. This combination of seasonal fluctuations in demand coupled with annual average adjustments in hours worked makes labor demand in the fisheries sector one of the most complex in Alaska.

Table 3

Adjusted Fish Processing Employment

Year	Food Processing* Employment (in thousands)	Average Weekly Mfg. Hours	Full-Time Adjusted Employment (in thousands)
1970	3.7	41.2	3.8
1971	3.6	40.1	3.6
1972	3.7	40.1	3.7
1973	4.1	36.6	4.2
1974	4.3	40.5	4.4
1975	4.3	36.6	3.9

*See footnote b, Table 2.

Source: Food processing employment: MAP Data Base; Average Weekly Manufacturing Hours: BL3, *Handbook of Labor Statistics*, 1980.

Forestry and Related Activities. The final labor demand component of Alaska's resource sector is forestry and related activities. This component exhibited a slow, stable pattern of growth in labor demand between 1961 and 1979. Workers involved in lumber, wood, and pulp manufacturing increased by approximately 2,000 over the 19-year period. Forestry employment is generally concentrated in Southeast Alaska, and the stability of labor demand, in large part, reflects federal policies limiting the number of cutting circles (and the established sustained yield cut) on federal lands. Labor demand in this component is substantially derived from the demand for wood products in foreign countries, particularly Japan.

While the current world-wide recession has caused a short-term fall in demand in Alaska's forest products industry, it also appears that Japan's own log production (which increased in the late 1970s), will have a long-term adverse affect on Alaska's forest products industry.[6]

Consequently, of all the labor demand components of Alaska's resource sector, the forest products industry exhibited the slowest rate of growth during the 1960s and 1970s, and this trend will probably continue during the 1980s.

Government Sector

The second major sector making up Alaska's basic demand for employment is government, and the trends in this sector are shown in Table 4 and illus-

[4]Scott Goldsmith and Lee Huskey, "Structural Changes in the Alaskan Economy: The Alyeska Experience," paper presented at the 29th Alaska Science Conference, August 1978.

[5]The average annual variation in employment was calculated by dividing the standard deviation of the employment series by the mean (average) employment level over the 6-year period.

[6]Brit Harvey, "Alaska Exports to Japan," *Alaska Economic Trends*, January 1982.

trated in Figure 4. Overall, total government employment exhibited substantial growth over the period 1961 through 1979, growing from about 56,000 workers to about 78,000 workers, an increase in labor demand of about 22,000 jobs.

Federal Employment. Although total government employment in Alaska grew over the 19-year period, 1961-1979, federal government employment declined by about 15 percent. This decline resulted from reduced levels of active duty military personnel stationed in Alaska. Federal civilian employment on the other hand increased slightly during the early 1960s and then remained stable at about 17,500 workers between 1965 and 1979. Federal employment as a percentage of total government employment in Alaska declined from about 85 percent in 1961 to about 53 percent in 1979.

The decline in federal military employment did

Figure 4. Government Sector Employment

Table 4

Government Sector Employment in Alaska, 1961-1979
(in thousands)

Year	Total Govt.	Federal Government			State Govt.	Local Govt.	Native* Corp.
		Total	Military	Civilian			
1961	56.3	48.1	32.5	15.6	14.6	3.6	
1962	58.0	48.7	33.0	15.7	5.2	4.1	
1963	60.0	49.6	33.0	16.6	6.2	4.3	
1964	60.4	49.6	32.4	17.3	6.3	4.6	
1965	62.7	50.4	33.0	17.4	7.0	5.3	
1966	64.1	50.7	33.2	17.5	7.7	5.7	
1967	65.5	51.1	33.7	17.4	8.1	6.3	
1968	64.7	49.5	32.6	16.9	8.6	6.6	
1969	65.6	48.8	32.3	16.5	9.3	7.5	
1970	67.0	48.6	31.4	17.1	10.4	8.1	
1971	67.9	47.2	29.9	17.3	11.7	9.0	
1972	71.3	48.0	30.8	17.2	13.3	10.0	
1973	70.0	44.2	27.0	17.2	13.8	10.6	1.4
1974	70.0	43.5	25.5	18.0	14.2	11.6	0.7
1975	72.9	43.6	25.3	18.3	15.5	13.3	0.5
1976	71.9	42.3	24.4	17.9	14.1	15.2	0.3
1977	74.1	42.7	25.0	17.7	13.9	17.2	0.3
1978	75.3	40.6	22.5	18.1	14.3	20.0	0.4
1979	78.4	41.2	23.3	17.9	15.0	21.6	0.6

*Native Corporation employment constructed by Scott Goldsmith of the Institute of Social and Economic Research from Native Claims Payment Data.

Source: MAP Data Base.

not adversely affect Alaska's economy as would have equivalent declines in the civilian workforce. Military personnel have relatively low levels of per capita income and consequently generate relatively low levels of demand for goods and services produced elsewhere in Alaska's economy. In 1978, for example, total wage and salary income earned by military personnel stationed in Alaska averaged just under 50 percent of the wage and salary income earned by federal civilian employees. Reductions in military employment consequently had only about one-half the impact that equivalent reductions in federal civilian employment would have produced.

State and Local Government. Both state and local government in Alaska substantially increased their work forces during 1960 through 1979. After growing at a moderate pace throughout the 1960s, state government demand for labor increased by about 1,000 workers per year during 1970 through 1975. After 1975, however, state government employment stabilized around 15,000 workers and was actually slightly lower in 1979 than it had been in 1975.

The demand for labor by local government generally paralleled the state government trend throughout the 1960s and then grew less rapidly during the first half of the 1970s. From 1975 through 1979, however, local government employment increased rapidly. In fact, during this 5-year period, local government increased by about 10,000 workers, while the increase during the prior 14 years had only been 8,000. Several factors seem to have produced this rapid growth. First, it appears that public school employment throughout the state grew rapidly during the last half of the 1970s and accounted for a significant part of local government employment growth. The passage of the federal government's Comprehensive Employment and Training Act (CETA) in 1973 and the Emergency Jobs and Assistance Act in 1974 provided funds to local governments for new jobs for unemployed residents (although funded through federal appropriations, the CETA workers were reported as part of the local government work force). In the first few years of the 1980s, however, the federal administration phased out all funding for public employment and training programs and completely eliminated the two sections of CETA which provided for direct public service job creation.

Other Basic Sectors

The two remaining sectors of Alaska's basic employment demand are tourism and heavy construction, both of which are reported in Table 5.

Tourism. The demand for labor derived from tourism in Alaska is scattered over the transportation, personal services, and retail trade industries. While no single one of these components of tourism employment is large, together they accounted for almost 4,500 workers in 1979. When viewed as a whole, the tourism sector displayed slow but steady growth throughout 1961 to 1979. By 1980 it generated a larger demand for labor than the state's entire forest products industry.

Heavy Construction. Heavy construction employment was stable between 1965 and 1979, except for the immediate post-pipeline period—1976-1978—when it increased sharply from about 4,500 workers to an average of about 8,000 workers. This jump in basic construction employment was not part of pipeline construction but was related to it. It came from the construction of the oil port and terminals at Valdez, which was induced by TAPS but was apparently reported separately as independent heavy construction.

The relative stability of basic construction employment during most of the historical period 1961-1979 appears to stem from the slow increase in major commercial or industrial capital improvement projects in Alaska. During the early 1980s, substantial commercial construction has been occurring in the Anchorage area, giving rise to a growth of labor demand in the basic construction sector. However, this phenomenon started after the period covered by the historical data presented in Table 5.

Labor Demand by Nonbasic Industries

When we turn from the demand for labor generated by basic industries in the state to the demand generated by nonbasic industries, a different picture emerges. While basic employment demand was dominated by a few sectors, (oil development and state government in the early and mid-1970s and fisheries and local government in the late 1970s) nonbasic employment demand grew with relative uniformity among all sectors. The sharp rise in nonbasic employment which occurred between 1973 and 1976 represented a cumulation of employment demands in the state's trade; service; transportation, communications, and utilities; and finance, insurance, and real estate sectors. These trends are illustrated in Figure 5 and presented in Table 6. All of the nonbasic sectors (excluding nonbasic construction which will be discussed below) exhibited an average annual rate of compound growth in labor demand of between 7 and 9 percent throughout the 19-year period (1961-1979).

Trade

Trade employment (excluding tourism) exper-

Table 5

Other Basic Employment, 1961–1979
(in thousands)

Year	Total Other Basic Employment	Total Tourism Employment	Component of Tourism*			Basic Construction Employment
			Transportation	Services	Retail Trade	
1961	3.1	0.7	0.1	0.3	0.3	2.4
1962	3.3	0.8	0.2	0.3	0.3	2.5
1963	3.7	0.8	0.2	0.3	0.3	2.9
1964	4.9	1.0	0.2	0.4	0.4	3.9
1965	5.3	1.0	0.2	0.4	0.4	4.3
1966	5.1	1.1	0.2	0.5	0.4	4.0
1967	5.4	1.3	0.3	0.5	0.5	4.1
1968	5.5	1.4	0.3	0.6	0.5	4.1
1969	5.9	1.5	0.3	0.6	0.6	4.4
1970	6.3	1.8	0.4	0.7	0.7	4.5
1971	6.8	1.9	0.4	0.8	0.7	4.9
1972	7.2	2.1	0.4	0.9	0.8	5.1
1973	7.2	2.4	0.5	1.0	0.9	4.8
1974	9.0	2.6	0.5	1.1	1.0	6.4
1975	8.7	2.9	0.6	1.2	1.1	5.8
1976	11.0	3.2	0.7	1.3	1.2	7.9
1977	11.3	3.6	0.7	1.5	1.4	7.7
1978	10.8	3.9	0.8	1.6	1.5	6.9
1979	9.9	4.3	0.9	1.8	1.7	5.6

*Estimates of industry shares allocated to tourism constructed by Scott Goldsmith.

Source: MAP Data Base.

ienced remarkably steady growth with only a slight increase in its growth rate during the pipeline period. In large part, the increased growth rate exhibited during pipeline construction was centered in the wholesale component of trade which appears to be more closely linked to the level of general business activity than it does to consumer demand.

Services

In a similar manner, employment in the personal services component of total service (excluding tourism) demand grew quite steadily during 1961-1979, while business service employment showed a clear bulge during the pipeline construction period. This bulge resulted both from direct employment and contracting for business services by the Alyeska Pipeline Company.

Also stimulating the demand for business services during the period was the state government, which often contracts with private firms for services and studies.

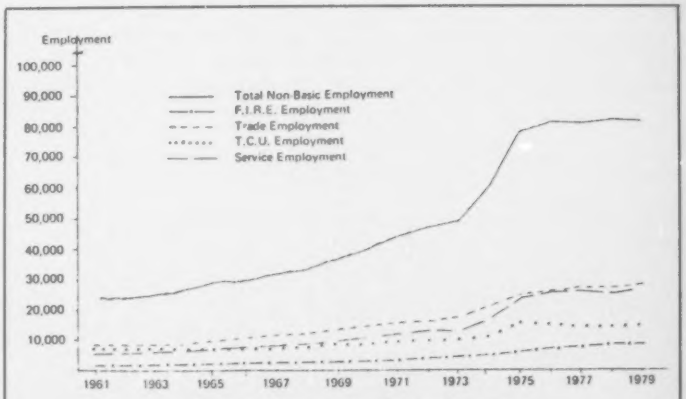

Figure 5. Nonbasic Employment

Transportation, Communication, Utilities

The transportation, communications, and utilities (TCU) sector (excluding both tourism-linked transportation and direct pipeline-related activity)

Table 6

Alaska Nonbasic Employment, 1961–1979
(in thousands)

Year	Total Nonbasic	Trade (except Tourism)			(Services (except Tourism)			Finance, Insurance & Real Estate	Transport. & Communication (except Tourism & Pipeline)	Public Utilities	Nonbasic Construction
		Total	Retail	Wholesale	Total	Business	Personal				
1961	24.0	7.9	6.3	1.6	5.4	0.7	4.7	1.5	6.5	0.4	2.3
1962	24.2	7.9	6.3	1.6	5.7	0.9	4.8	1.7	6.3	0.5	2.1
1963	25.1	8.3	6.7	1.6	6.0	1.0	5.0	1.9	6.2	0.5	2.2
1964	26.4	8.5	6.8	1.7	6.4	1.2	5.2	2.0	6.1	0.6	2.8
1965	29.2	9.6	7.7	1.9	7.1	1.4	5.7	2.2	6.4	0.7	3.2
1966	29.4	10.3	8.2	2.1	7.4	1.4	6.0	2.3	6.4	0.7	2.6
1967	31.5	11.3	8.9	2.4	8.2	1.6	6.6	2.3	6.5	0.7	2.5
1968	33.0	12.0	9.4	2.6	8.8	1.8	7.0	2.5	6.8	0.7	2.2
1969	37.0	13.3	10.4	2.9	9.8	2.1	7.7	2.7	7.7	0.8	2.7
1970	40.4	14.7	11.5	3.2	10.7	2.0	8.7	3.1	7.9	0.8	3.2
1971	43.5	15.4	12.2	3.2	11.8	2.1	9.7	3.2	8.5	0.9	3.7
1972	46.8	16.2	12.9	3.3	13.2	2.1	11.1	3.7	8.6	0.9	4.2
1973	48.7	17.4	14.0	3.4	12.8	2.1	10.7	4.2	8.9	1.0	4.4
1974	59.9	20.1	16.1	4.0	16.6	2.9	13.7	4.9	10.8	1.0	6.5
1975	78.4	25.1	19.2	5.9	23.4	7.3	16.1	6.0	14.8	1.1	8.0
1976	81.4	26.3	20.2	6.1	26.1	8.7	17.4	7.1	14.0	1.2	6.7
1977	81.2	27.1	21.2	5.9	25.7	7.0	18.7	7.8	13.0	1.3	6.3
1978	82.0	27.3	21.6	5.7	25.6	5.2	20.4	8.2	13.1	1.4	6.4
1979	81.4	27.7	22.2	5.5	26.0	4.8	21.2	8.0	13.3	1.4	5.0

Source: MAP Data Base.

underwent a steady growth of employment demand, punctuated by a fairly rapid rise in its work force during the early pipeline years. As with the other nonbasic sectors, TCU employment appears to derive primarily from the growth of Alaska's consumer income and purchasing power. However, the transportation sector was particularly affected by the pipeline as large amounts of construction materials and large numbers of workers were transported to Alaska. Public utility employment, on the other hand, has increased moderately but steadily throughout the 19-year period, 1961 through 1979.

Construction

Nonbasic construction employment in Alaska primarily consists of workers employed in building single-family residences and other forms of housing. This type of employment demand derives more from population growth than it does from the growth of personal income. Consequently, this type of employment demand grew rapidly during pipeline construction as Alaska's population increased significantly. However, when the demand for nonbasic construction workers fell in the immediate post-pipeline period, Alaska appears to have exhibited a net loss of population.

Summary

Overall, industrial labor demand in Alaska has shifted during the last 20 years from a dominance by Federal defense activity to dominance by today's natural resource sector. When oil revenues used to support the growth of state and local government are included, natural resource activity is the dominant force affecting the demand for labor among basic industries in the state. Among nonbasic industries, retail trade; personal services; finance, insurance, and real estate; and transportation, communications, and utilities all appear to derive their demand for labor primarily from the growth of consumer income. Business services and wholesale trade are more closely linked to the general level of business activity and derive their labor demand primarily from interindustry labor demand. Nonbasic construction appears to be primarily related to the growth of the state's population.

OCCUPATIONAL LABOR DEMAND

Occupational labor demand is affected by many factors, some of which we understand only imperfectly. These factors include changes in productive technology and changes in consumer demand for goods versus services. In addition, larger businesses may exhibit differences between their occupational requirements and their occupational demands because of internal labor markets. Notwithstanding these qualifications, understanding patterns of occupational

demand is important since a mismatch between skills desired by employers and those possessed by the unemployed can cause structural unemployment; i.e., the inability of Alaskans to find jobs despite high levels of total labor demand.

Figure 6 presents the occupational distribution of Alaska's labor force during 1973 and 1977-1979. The comparisons shown in Figure 6 are not precise because the two sets of data come from different sources which used different estimating techniques.[7]

Notwithstanding these difficulties, it appears that over the last decade, the demand for clerical and, in particular, service workers has been rising compared to all other occupations.[8] This more rapid rate of growth is in large part attributable to the pattern of industrial labor demand discussed earlier. The rapid rates of growth in trade, finance, insurance, real estate, and other nonbasic industries contributed to the increase in the demand for clerical skills. At the same time, these industries, plus tourism, produced an increase in the demand for building maintenance and food-service workers, such as waiters/waitresses, counter attendants, and cooks. Finally, the growth of public services caused an increase in the demand for childcare workers, social-service aides, medical assistants, and related occupations. These trends become evident when we examine the occupational structure of labor demand associated with the various industries in Alaska's economy.

Government

Federal

Table 7 presents the occupational distribution of workers employed in the government sector. Reflecting the many technical functions performed by the federal government here, approximately 30 percent of all federal civilian workers in Alaska have either professional or technical jobs, while an additional 25 percent provide clerical support. At the same time, approximately one out of every three federal civilian employees is engaged in some type of maintenance or production occupation, reflecting the extensive federal facilities (particularly military) in Alaska. The relatively small number of managers and administrators employed by the federal government in Alaska (6.2 percent) reflects the operational nature of federal activities here with most managers and administrators located at the various regional headquarters in Seattle.

State and Local Government

State government's administrative employment is also similarly concentrated in professional and technical occupations (31.5 percent), reflecting the active management of state programs, with slightly better than 18 percent of all state non-educational workers classified as managers or administrators. In contrast, local government is most often the operator of public programs and has relatively low concentrations of professional, technical, managerial, and administrative workers. Also reflecting the operational nature of local government activity is the relatively high concentration of maintenance, production, and service workers who comprise almost 52 percent of all local government non-educational employment.

Educational employment at the state level involves the operation of Alaska's post-secondary educational institutions. At the local level, it involves operating the public schools from kindergarten through high school. At both the state and local levels, however, over half of all educational workers are in the professional and technical category while an additional 21 to 23 percent are employed in clerical support activities.

The rapid growth of local government employment, compared with state government, helps to explain the decline in percentage of managers and administrators between the early and late 1970s.

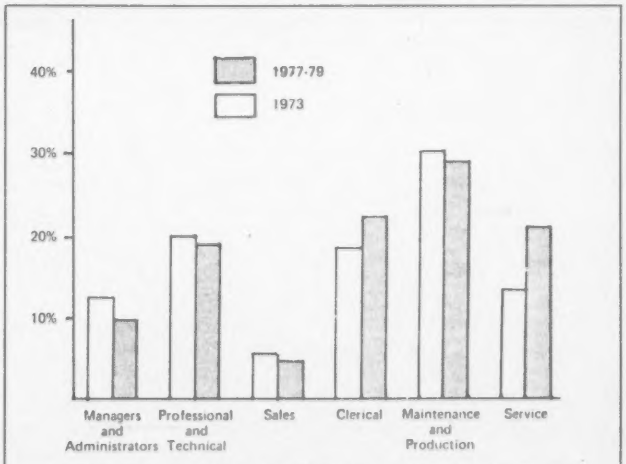

Figure 6. Occupational Distribution of the Labor Force

[7]Data for the 1977-79 period comes from surveys of Alaska employers who are covered by Alaska's Employment Security Act, as reported in the various *Occupational Employment Statistics* publications issued by the Alaska Department of Labor. Data for the 1973 period comes from a computer tape of 440 occupations by 227 industries, developed from the 1970 census (as reported in "A Forecast of Industrial and Occupational Employment in Alaska," ISER, 1974).

[8]The total demand for workers in all occupations rose in Alaska during the decade of the 1970s. The relative growth of clerical and service workers, compared with all other occupations, implies that these occupational categories were rising more rapidly, not that the other occupations were falling.

Averaged over all forms of civilian government employment, however, this sector's occupational patterns are still concentrated in white collar activities. More than two out of every three government employees are involved in managerial, administrative, professional, technical or clerical occupations, while less than one out of every three is involved in maintenance, production, or services. Because local government employment has been growing more rapidly than that of state government in recent years, the demand for blue-collar trade and service workers has increased more rapidly than would have been true had all sectors of government grown proportionately.

Manufacturing

In contrast to government, with its high concentration of white-collar workers, Alaska' manufacturing firms have a high concentration of blue-collar employees. On the average, over four out of every five manufacturing workers are involved in some type of maintenance, production, or service activity—with the greatest concentration being in production occupations (Table 8).

Construction

In a similar manner, the construction trades in Alaska are dominated by blue-collar workers, with over three out of every four construction employees being involved in some type of maintenance or production activity (Table 9).

Mining, Oil, and Gas

Mining, and oil and gas employment is also concentrated in maintenance and production activities, but reflecting its high technology, this group of industries employs almost 25 percent of its work force in professional and technical occupations—a significantly higher proportion than is true for either manufacturing or construction.

Nonbasic Industries

The data presented in Table 10 on the occupational distribution of nonbasic employment in Alaska displays patterns markedly different from those found in such basic employment sectors as government, manufacturing, or construction.[9] For example, the demand for clerical and service workers in the nonbasic sectors is substantially higher than the basic sectors while the demand for maintenance and production workers is substantially lower. Managerial, administrative, professional, and technical workers are more in demand in the nonbasic sectors than in all basic sectors except government. Overall, occupational demand among nonbasic industries is more concentrated in occupations (both white- and blue-collar) requiring lower skills.

Summary

The demand for labor in Alaska, in contrast to the United States as a whole, is more highly concen-

[9]The terms "basic" and "nonbasic" are used in this section to refer to industry activities, where in the preceding section they referred to sectors of the economy. Although the terms refer to essentially the same industrial groupings, this distinction (necessitated by data availability) should be kept in mind.

Table 7

Occupational Distribution of Government Employment

Position Title	Total Government	Federal Government Total Federal Civilian[a]	State Government Total State	State Government Administration[b]	State Government Education[a,c]	Local Government Total Local	Local Government Administration[b]	Local Government Education[a]
Manager or Administrator	9.4%	6.2%	15.7%	18.1%	9.4%	6.9%	9.2%	5.5%
Professional and Technical	34.6	30.1	38.5	31.5	55.5	36.1	12.7	51.2
Sales	0.2	0.4	0.1	0	0.4	0.1	0.1	0
Clerical	24.1	24.9	25.2	26.1	22.7	22.8	26.0	20.7
Maintenance and Production	20.6	33.9	9.9	11.1	6.2	17.2	33.2	6.8
Service	11.1	4.5	11.0	13.0	5.8	17.0	18.7	15.9

[a]1977 Data.
[b]1979 Data.
[c]Includes estimated 3.7 percent private post-secondary education employment.

Note: Columns may not add up to 100 percent due to rounding.
Source: *Occupational Employment Statistics*, Alaska Department of Labor.

Table 8

Occupational Distribution of Manufacturing Employment[a]

Position Title	Total Manufacturing	Food Processing	Forest Products[b]	Printing & Publishing	Other Manufacturing
Manager or Administrator	4.6%	4.2%	3.6%	7.9%	8.2%
Professional and Technical	2.8	1.1	3.3	13.3	4.0
Sales	1.4	1.0	0.8	5.5	2.9
Clerical	8.0	7.1	4.8	29.3	10.0
Maintenance and Production	77.9	80.9	81.0	42.9	73.6
Service	5.3	5.7	6.6	1.0	1.3

[a]1977 data.

[b]Including lumber, wood products, and pulp.

Note: Columns may not add up to 100 percent due to rounding.

Source: *Occupational Employment Statistics*, Alaska Department of Labor.

trated in the white-collar occupations. Furthermore, white-collar and blue-collar occupations in Alaska represent quite different patterns of labor demand than they do in the other states. This is illustrated in Figure 7 which compares the occupational distribution in 1979 of Alaska and the United States, excluding farm workers.[10]

In the white-collar occupations here, the demand for labor is relatively concentrated in jobs requiring high levels of education and skill. In blue collar occupations, the demand for labor is relatively concentrated in jobs requiring lower skills. This pattern appears to result from the large size of government and the small size of manufacturing in this state's basic economic sector. It in turn results in a condition where jobs traditionally held by older and better educated workers make up a disproportionately large share of the total labor demand in Alaska, while the occupations traditionally held by younger, lesser-educated workers[11] make up a smaller share of total labor demand than is true in the rest of the United States.

[10]U.S. Data was obtained from the *Handbook of Labor Statistics* (Bulletin 2070), U.S. Department of Labor, December 1980.

Table 9

Occupational Distribution of Other Basic Employment*

Position	Total	Mining, Oil & Gas	Construction
Manager or Admin.	8.4%	5.0%	9.7%
Profess. & Tech.	9.8	24.5	3.8
Sales	0.9	0.6	1.0
Clerical	9.2	11.6	8.2
Maint. & Prod.	70.0	56.3	75.6
Service	1.8	1.9	1.7

*1978 data.

Note: Columns may not add up to 100 percent due to rounding.

Source: *Occupational Employment Statistics*, Alaska Department of Labor.

CONCLUSIONS

Alaska's demand for labor is derived from the tastes and preferences of consumers in the state, the nation, and the world. During the 1960s, these preferences were focused primarily on the state's forestry and fishery resources and its geographic location, which gave Alaska a unique importance in the nation's defense system. This resulted in the dominant importance of military (including civilian military) employment in the state's economy, followed by employment in the fishing and forest products industries. The income generated by these activities produced the in-state consumer demand for retail goods and services. As a result, the demand for labor from international, national, and state sources grew in a roughly proportionate manner throughout the 1960s.

[11]Workers who are new to the labor force and are seeking to acquire skill advancement.

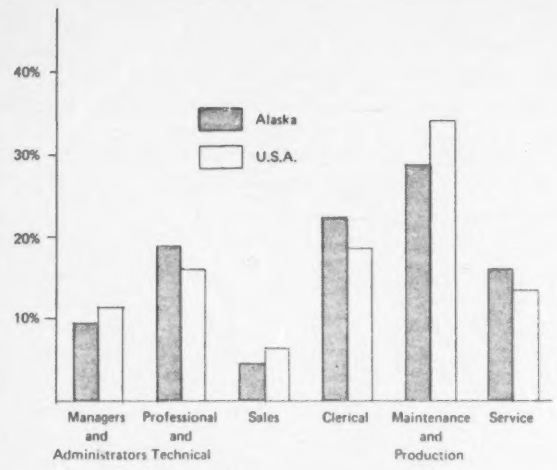

Figure 7. Alaska and U.S.A. Occupational Distributions, 1979 (excluding farm workers)

During the first part of the 1970s, the growth of state expenditures (financed by the $900 million oil lease sale revenues received in 1969) produced a rise in the state's real personal income that was unrelated to any growth of basic sector employment. As a result, employment in trade, finance, services, and other nonbasic activities increased more rapidly than did the economy's basic sector. White-collar occupations (which had traditionally dominated Alaska's labor markets due to the large size of government employment) became even more concentrated while the major growth of blue-collar jobs shifted from operations and maintenance trades requiring higher skills to service trades requiring lower skills.

This pattern was reversed by construction of the Trans-Alaska Pipeline System and its terminal facilities at Valdez during 1974 through 1977. During this time, Alaska's labor markets underwent a rapid growth of construction and other blue-collar jobs requiring higher skills. The rapid growth of personal income caused by TAPS also caused a sharp rise in demand for labor in the trade and service sectors.

Completion of TAPS construction saw a return to the labor market pattern of the early 1970s. Financed by revenues from oil taxes and royalties, state expenditures triggered a growth of demand for trade and service workers unrelated to any expansion in the state's basic sector employment. As a result, nonbasic employment remained high even though the demand for labor in oil and mineral activities declined by almost 14,000 workers between 1976 and 1978.[12]

Equally important, the expanding sectors of

[12]The growth of fisheries, local government, and tourism helped offset the large employment loss in oil and minerals, but total basic employment still declined significantly over the period.

Table 10

Occupation Distribution of Non-Basic Employment

Position Title	Trade[a]	TCU[a]	Fire[b]	Services[b] Total	Services[b] Personal & Business Services	Services[b] Professional Services
Manager or Administrator	11.6%	9.0%	18.9%	10.2%	8.8%	11.5%
Professional and Technical	3.0	19.2	8.4	22.5	8.2	36.7
Sales	24.3	1.4	5.5	1.6	2.8	0.5
Clerical	22.3	25.9	56.5	23.2	18.9	27.6
Maintenance and Production	20.5	40.6	6.1	12.7	17.6	7.9
Service	29.3	3.9	4.7	29.7	43.8	15.8

[a]1979 data.

[b]1978 data.

Note: Columns may not add up to 100 percent due to rounding.

Source: *Occupational Employment Statistics*, Alaska Department of Labor.

basic employment during the the late 1970s (except for fisheries) generated a relatively high demand for white-collar jobs, a trend reinforced by the strong growth of the state's nonbasic sectors. Contrary to many non-Alaskans' conception of the state, Alaska's labor markets by the end of the 1970s were generating a demand for white collar workers (particularly professional and technical workers) substantially greater than was true for practically anywhere else in the nation.

As Alaska moves further into the 1980s it becomes increasingly important to understand and anticipate the patterns of labor demand in the state. Labor markets appear to be segmented by industry, by occupation, and by size of firm. As a result, the growth of total employment in the state is no guarantee that resident Alaskans will be able to find well-paying, stable jobs that offer them potential for career advancement. If these labor market benefits are to be achieved through the process of economic growth, we will need to gain a better understanding of the structure of labor demand in the state.

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